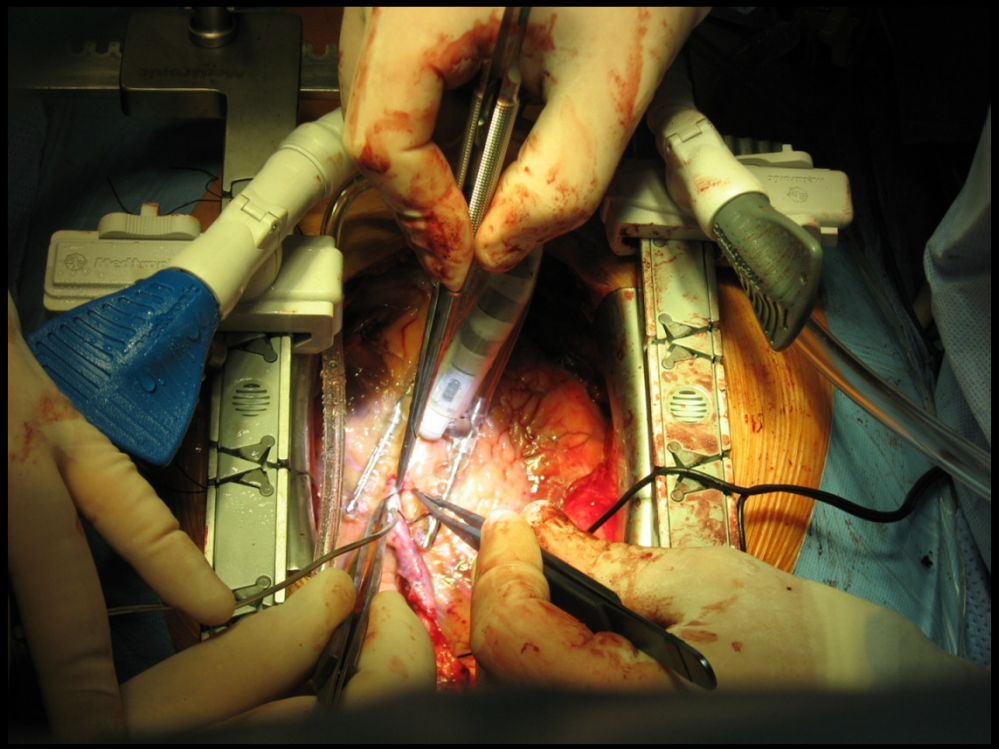
# About OMICS Group

OMICS Group is an amalgamation of Open Access publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 500 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 500 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

# About OMICS International Conferences

OMICS International is a pioneer and leading science event organizer, which publishes around 500 open access journals and conducts over 500 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.



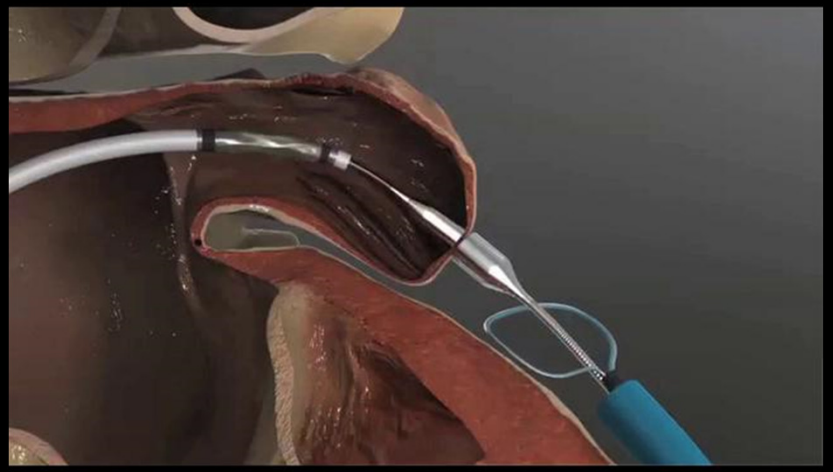
Arthur T. Martella, M.D.

# MINIMALLY INVASIVE APPROACHES IN CARDIAC SURGERY

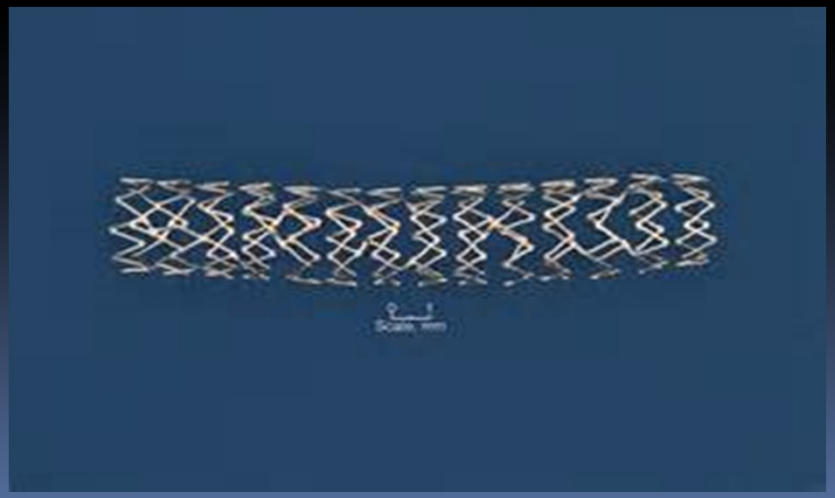
# 1996



# Current Environment of Cardiac Surgery





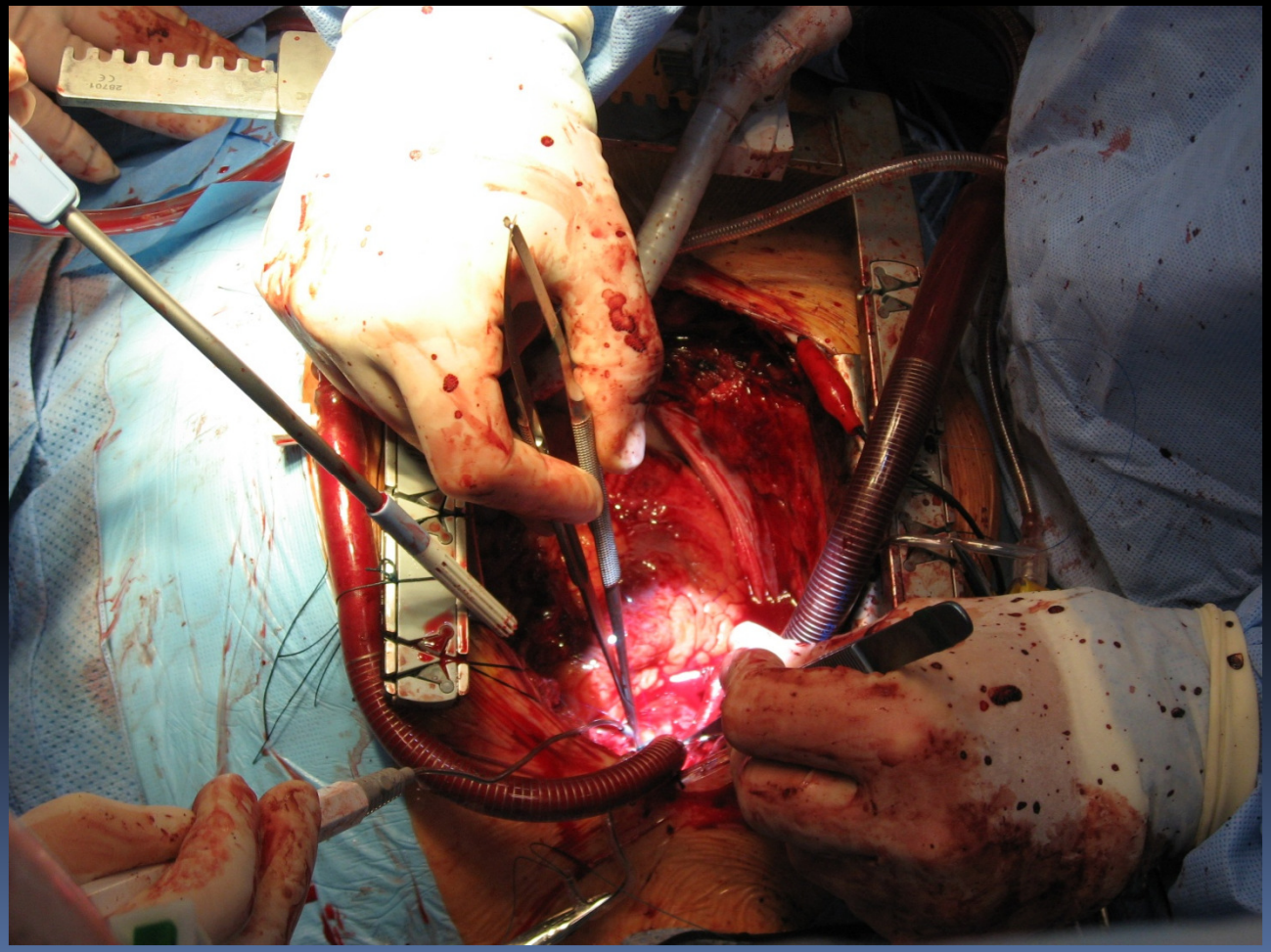




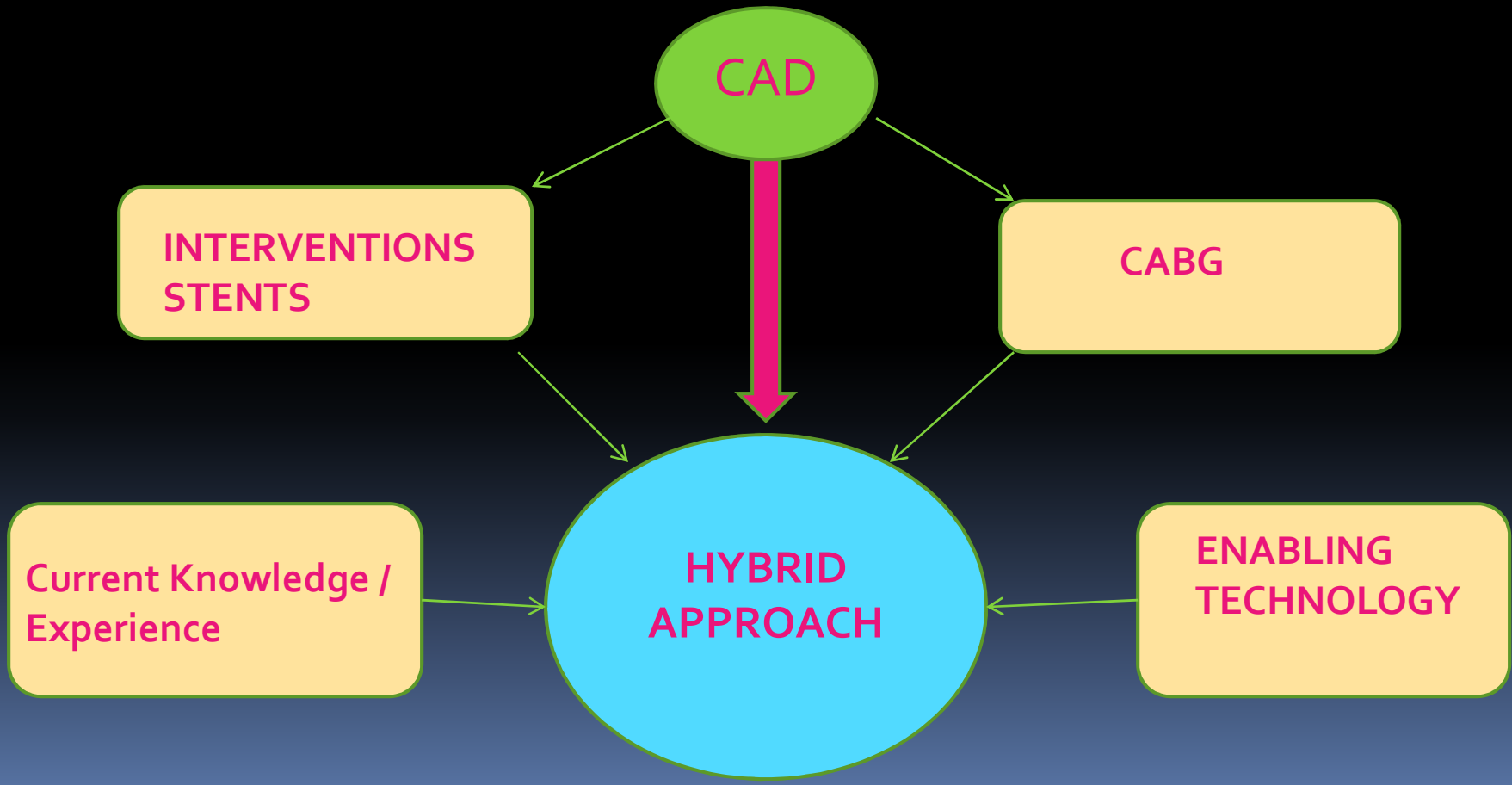
# Acceptable Results

- TAVR – Mild – moderate AI
- Mitraclip – 2+ MR
- Coronary Stents – Plavix / Brilinta
  - Incomplete revascularization

# Why doesn't everyone want Open Heart Surgery?



# CAN WE DO A BETTER JOB OF TREATING CORONARY ARTERY DISEASE?



# Non-Sternotomy Approach

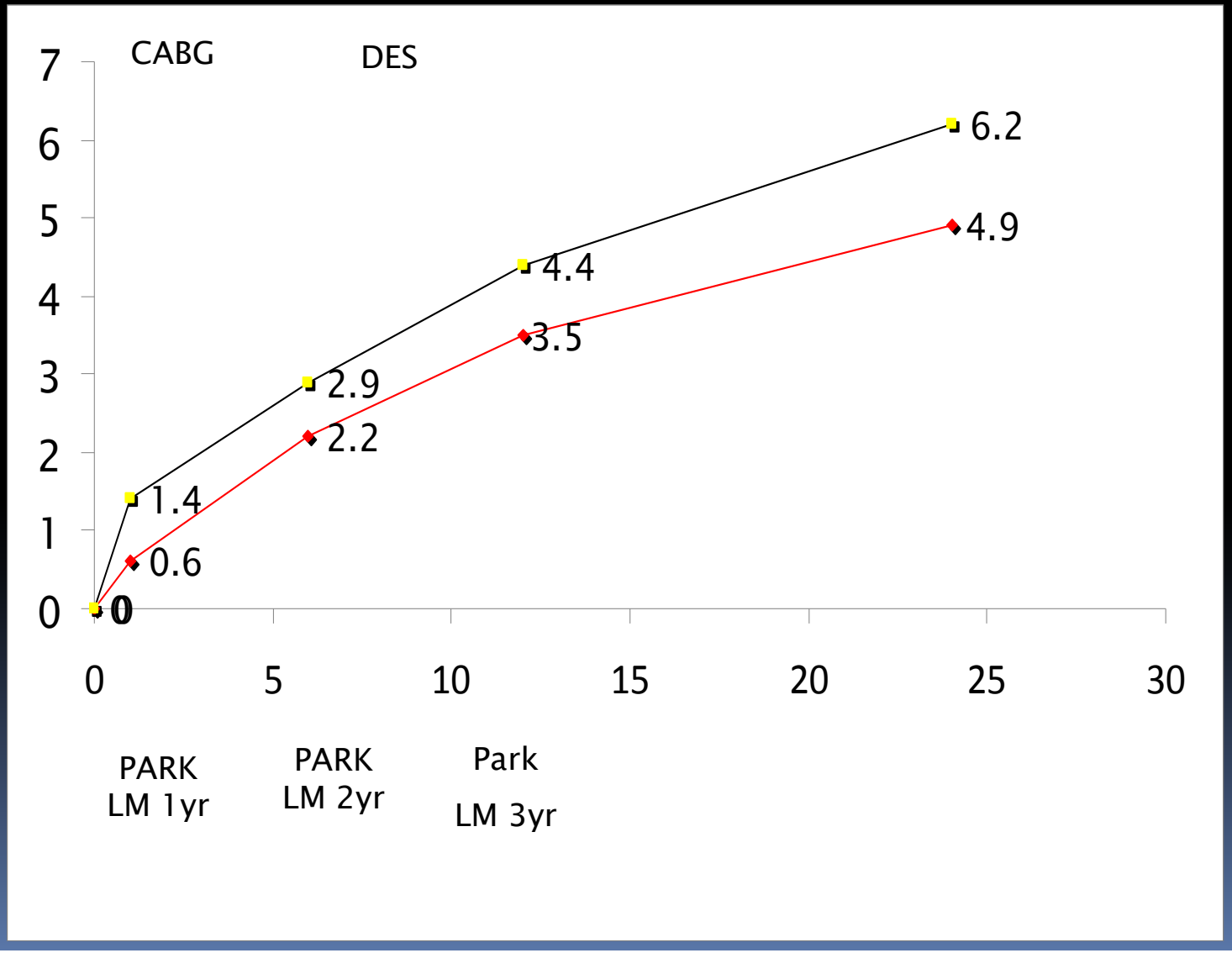
- Mini Right Thoracotomy AVR
- Robotic / MiniThoractomy MVR
- Multivessel / Robotic Assisted MIDCAB
- Hybrid Robotic MIDCAB
- TECAB

# Coronary Artery Bypass Grafting Surgery

# Baby Boomers
# 10,000 / Day



# All Cause Mortality - Syntax



# 20 YEARS AGO

**Five-year results of coronary bypass grafting for patients older than 70 years: role of internal mammary artery**

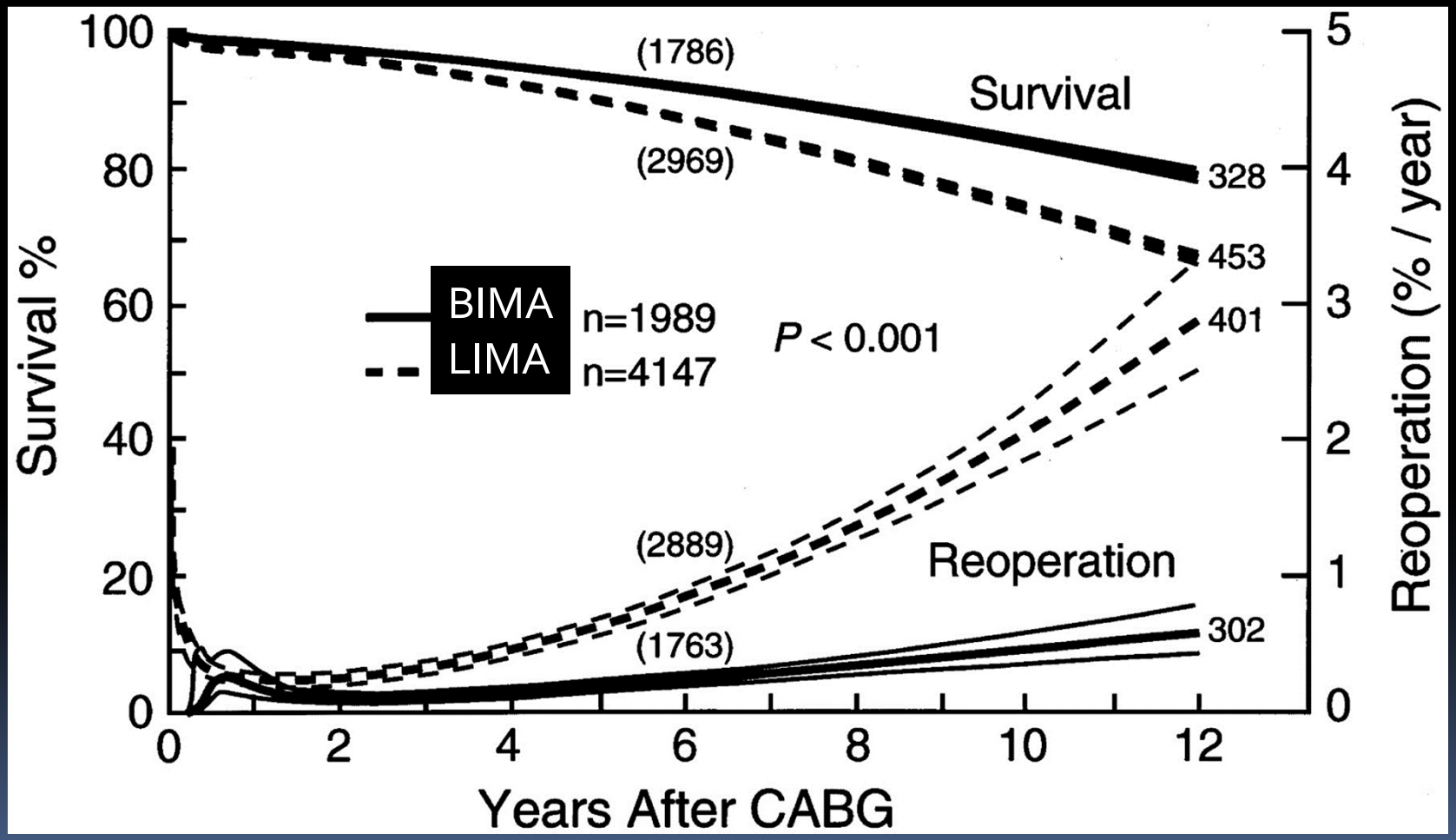
**M Azariades, CL Fessler, HS Floten and A Starr**
Heart Institute, St. Vincent Hospital and Medical Center, Portland, Oregon.

- Benefit of LIMA and vein vs just vein

- Today – LIMA / 2 Veins On Pump STILL most common operation for Severe 3VD

The Annals of Thoracic Surgery, Vol 50, 940-945, 1990

# LIMA vs. BIMA




Lytle BW et al. JTCVS 1999;117:855-72

# Stents v. CABG

- Pts and Cardiologist are willing to accept a greater mortality to avoid the invasiveness of "open" heart surgery

# Best Surgical Treatment for CAD

- Pedicled IMAs when indicated
- Free IMA / RA when pedicled IMAs not pos.
- Vein grafts utilized based on quality of conduit and competitive flow
- Off –pump approach if:
  - Graft patency could be confirmed intra-operatively
  - Complete revascularization is possible
- Minimize manipulation of aorta
- Non Sternotomy approach

AM1

# Can we get rid of the "OPEN" in "OPEN HEART SURGERY"?

## Slide 17

**AM1** Art Martella, 3/9/2010

# Enabling Technology

- Da Vinci Robot
- Stabilizers / Positioners
- Anastomotic Devices / Techniques
- Flow measurements
- Imaging
  - Hybrid suite – angiography
  - CT angiography
- Sealants / hemostatic agents

# Surgical Robotics

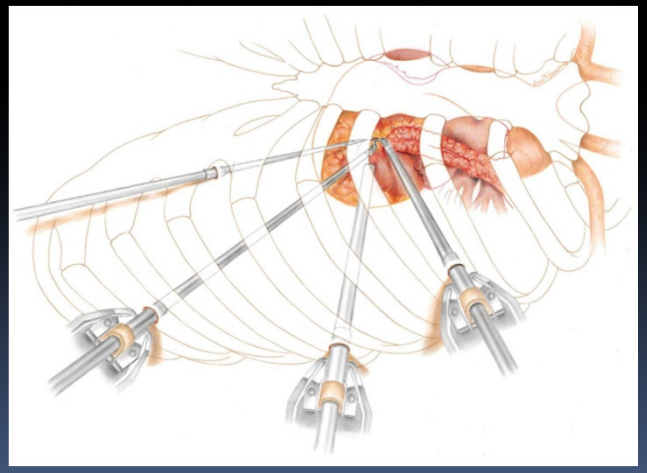




- HD 3D Endoscope
  - no loss of depth perception
  - variable magnification to 15X
- Fully wristed Instruments
  - 6 degrees movement within minimal space
  - scaled motion for fine control
- Visual clues are used to compensate for the loss of touch

# Application of the Robot to Coronary Revascularization





- IMA preperation
  - skeletonized Lima
  - skeletonized Rima
- Pericardiotomy
  - target localization
  - target stabilization
- Anastomosis
  - direct vs robotic
  - hand sewn vs U-clip vs stapled

# Enabling Technology: Neurologic Events



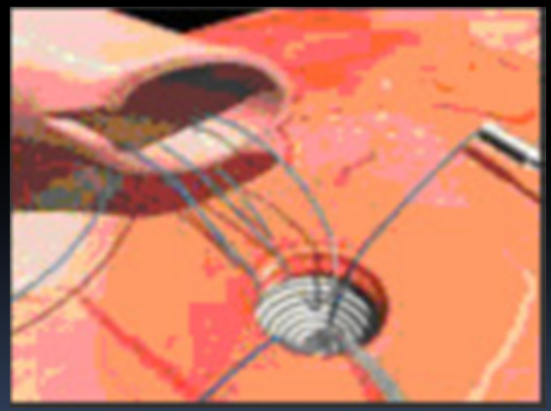
STROKE

Neurologic Events

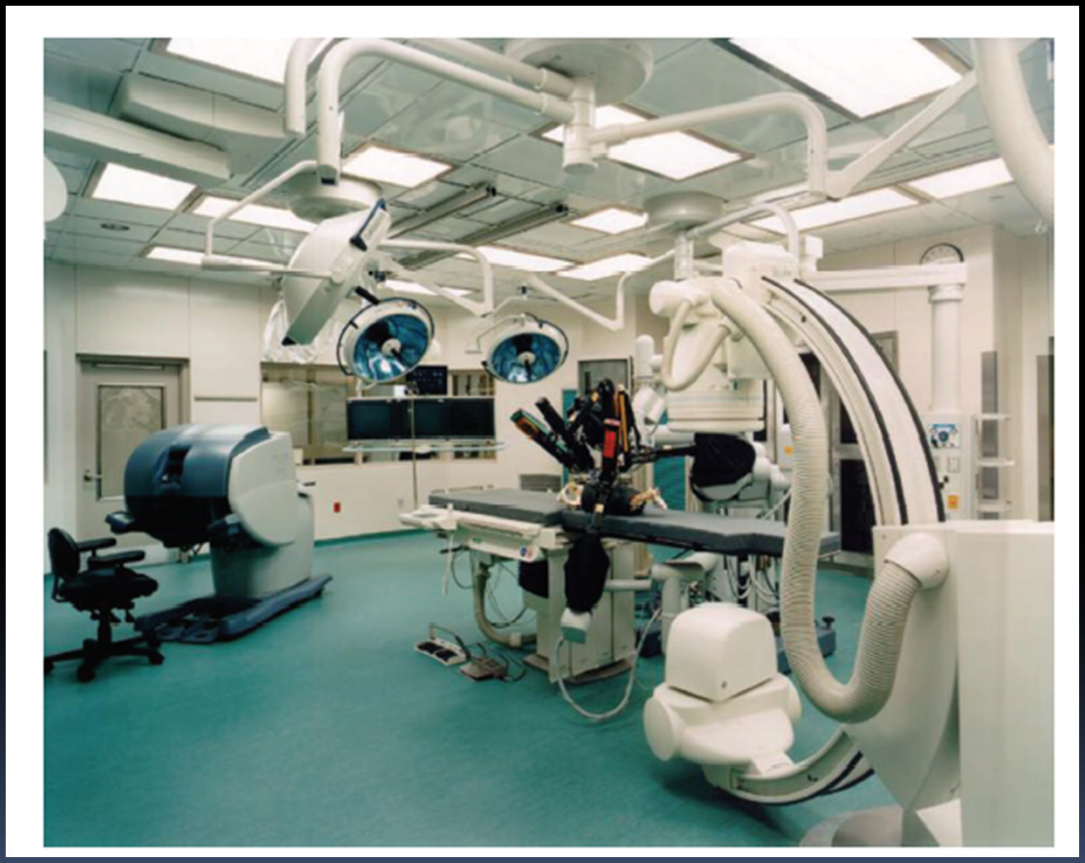
# Aortic Manipulation

- Off -pump approach
- Pedicled IMAs v. Y-grafts off IMA
- Proximals with Heartstring device



# The Hybrid Suite






23

# Main Concerns About Minimally Invasive CABG

1. Compromise completeness of revascularization/long-term patency
2. Sternotomy is benign
3. Not financially viable
4. Not enough candidates


1. Robicsek F. Time told! J Thorac Cardiovasc Surg. 2008; 135(2):243-6.
2. Damiano R. Robotics in cardiac surgery: the Emperor's new clothes. J Thorac Cardiovasc Surg. 2007;134(3):559-61.

# The Problem

1. How do we do a TECAB procedure utilizing a running suture technique?
    1. More likely to be adopted by surgeons
    2. Simultaneous stenting in hybrid suite more feasible
    3. Platform for multivessel procedure

# ULTIMATE GOAL

**Hybrid Stenting / Beating Heart Totally Endoscopic Multivessel CABG with Primarily Mammary / Radial Artery Grafting**

## How Do We Get There?

**Team Support**

**Step by Step Approach**

**Outcome Monitoring**

# What do you NEED to get started?

- The Team
  - Surgeon / PA team critical
  - OR Nursing / Anesthesia
  - Cardiology
  - C suite
- Problem solving approach
- Appropriate use of new technology

# Practice, Practice, Practice



# The Process:
# Early Stage

- Lab training – Cadaver / pig hearts



- Practice / Practice / Practice



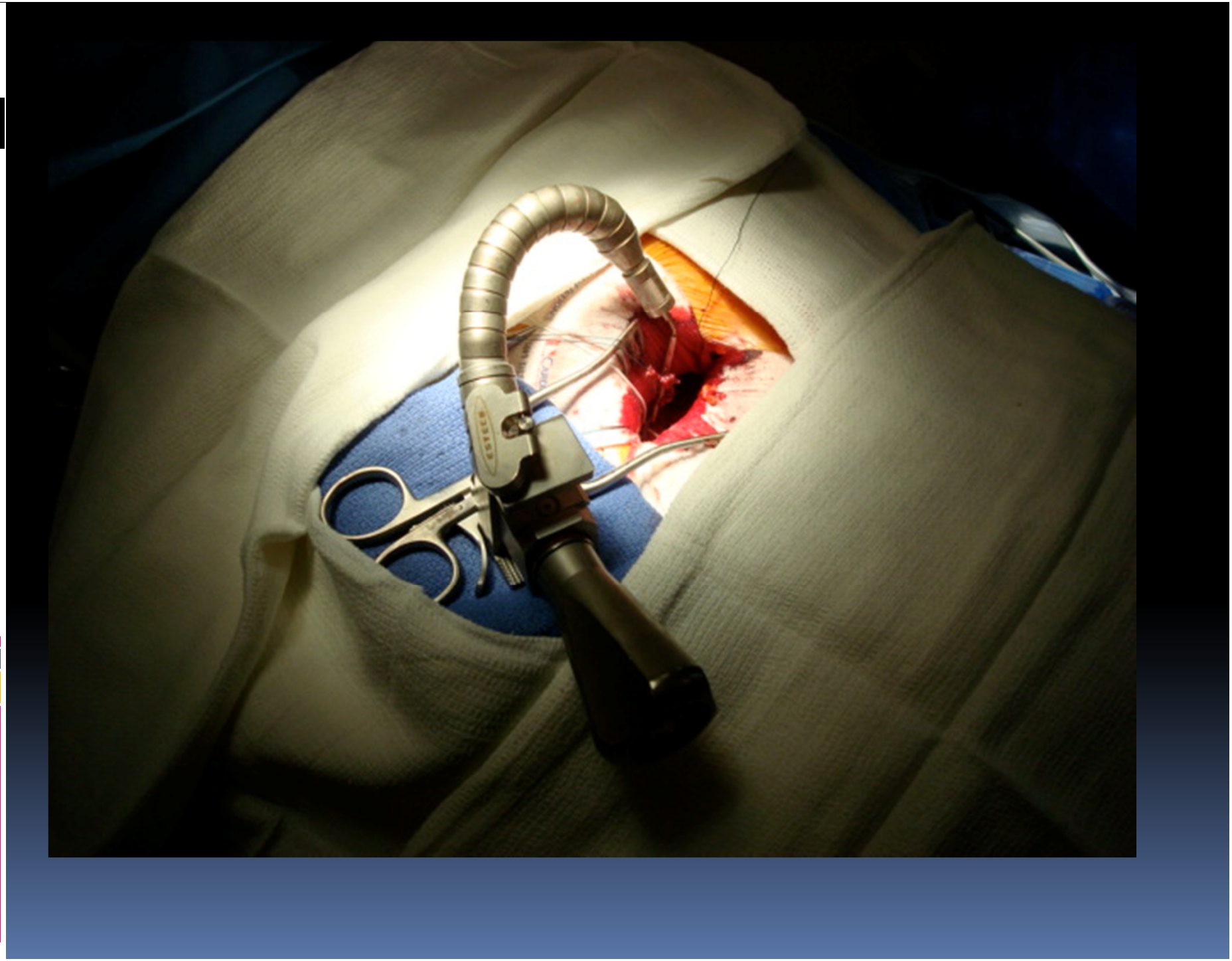
- Left Mammary Takedown > Sternotomy



- Robotic Mammary takedown > Midcab

# Don’t Start Here!





# The Process:
# Second Stage - Options

- Use NS Stabilizer / Positioners
- Bilateral Mammary Takedown with Da Vinci
- Proximals

# Transitioning from Single Vessel to Multi-vessel MIDCAB

## ARTERIAL GRAFTING

- Review with Interventional Cardiology
  - What needs grafting
  - What can be stented
- Bilateral Pedicled IMAs
  - Skeletonized IMAs
- Y-Grafting of IMAs or Radial Artery
- Femoral-Femoral Bypass

# The Process:
# Third Stage: Refining

- Pain Management
- Ultra Fast-Tracking
- Multivessel CABG Through Small L. Thoracotomy

vs

TECAB

# Hybrid Coronary Revascularization

- "Best of both worlds": IMA + benefits of minimally invasive
- Expands minimally invasive CABG
- Expands PCI (e.g. protected LM)
- Angiographic confirmation of grafts

# BH-TECAB

**BEATING HEART TOTALLY ENDOSCOPIC CORONARY ARTERY BYPASS**

- CABG performed in a totally closed chest setting with robotic assistance
- Entire surgery performed through 4 – 5 ports on the right or left side of the chest
- Use of ITAs as primary bypass conduits
- PCI for complete revascularization in complex multivessel CAD

Evolving Technology

# Simultaneous hybrid coronary revascularization reduces postoperative morbidity compared with results from conventional off-pump coronary artery bypass

Zachary N. Kon, BA,[a] Emile N. Brown, BS,[a] Richard Tran, BS,[a] Ashish Joshi, MD, MPH,[b] Barry Reicher, MD,[c] Michael C. Grant, BS,[a] Seeta Kallam, MD,[a] Nicholas Burris, BS,[a] Ingrid Connerney, PhD,[d] David Zimrin, MD,[c] and Robert S. Poston, MD[a]

"Perhaps because of reduced myocardial injury, inflammation and activation of coagulation, patients undergoing the hybrid procedure had better perioperative outcomes and satisfaction"

**Simultaneous hybrid coronary revascularization reduces postoperative morbidity compared with results from conventional off-pump coronary artery bypass**

- Hybrid patients:
  - Shorter intubation times
  - Shorter ICU times
  - Overall cost the same
  - Return to work greatly improved
  - Patient satisfaction scores higher
  - Similar patency of target vessels

# Conclusions

- Step by Step Approach to Multivessel MICS
- Collaborative / Hybrid Procedure
- Position Program to take advantage of new, evolving technology
- Increased volume of cases / shorter LOS
- Initially low risk patients >> high risk pts

**“Vision is the capacity to see the invisible that inspires us to do the impossible”**

# Thanks' for your kind attention!!!!!!



# Let Us Meet Again

We welcome you all to our future conferences of OMICS International

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http://www.conferenceseries.com/clinical-research-conferences.php